Study on the plate model of the Pacific plate

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The Cabinet Office is conducting examination of the largest class earthquakes in the Japan Trench and the Kuril Trench in the "Council for studying megaquake models in the Japah trench and the Kuril trench (established in February 2015)". As a part of that, we examined the shape of the Pacific plate upper surface subducting beneath the Izu-Ogasawara Trench, Japan Trench and the Kuril Trench to create a plate model.
Several models are proposed for Pacific plate along the Japan trench and the Kuril trench, However, some of them are limited to the specific areas and are not consistent with the hypocenter distribution.
In this study, we created the plate model along the Izu-Ogasawara Trench, Japan Trench and the Kuril Trench based on the following data.

A) Location of the trench axis: We set the trench axis that is made by smoothly connecting the deepest part of the seabed topography data (provided by the Japan Coast Guard), and it was used as the boundary line between the plate upper surface and seabed topography.
B) Structure exploration data by JAMSTEC: We used depth data of the Pacific plate provided by JAMSTEC along MSC and OBS survey lines to constrain the shapes of shallow part of the Pacific plate upper surface.
C) Hypocenter Distribution: We used JMA Unified earthquake catalog, ISC catalog and EHB catalog to constrain shapes of the Pacific plate upper surface in the shallow and deep area.
D) Volcanic Front Position: We set the 100km depth of plate position based on the position of the volcano front for areas where the plate shape could not be determined due to low seismicity.

Using the above data, we set many cross sectional shapes of the upper plate surface approximately orthogonal to the trench axis. And a planar plate upper surface model was created by interpolating the cross section data.

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